District's Exhibit No. 6

Estimated Costs and Benefits of Rerouting Trains with Hazardous Materials
To Avoid The Highest-Threat Target Cities

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Committee on Public Works and the Environment

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Good afternoon. My name is Ted Glickman. I am a faculty member of the business school at George Washington University. For the past 25 years I have been performing research studies in freight systems safety at the U.S. Department of Transportation and the Association of American Railroads and as a consultant to government and industry. I am the author of a number of peer-reviewed publications on the risks of hazardous materials transportation and the re-routing of truck and train shipments of hazardous materials. I also designed the PC*HazRoute software package produced by ALK Associates of Princeton, which was used to generate the maps of train routes that have been shown to the Council before.

Throughout my research career I have been an advocate of risk-based decision making for safety issues in general and homeland security issues in particular. As a researcher in this subject area and as a resident of one of the highest threat locations in the U.S., I am very interested in the issue that has come before the City Council regarding the advisability of re-routing certain tank car shipments around the city of Washington, D.C. In my professional opinion, there are ample opportunities here and elsewhere for re-routing hazardous material tank car traffic to avoid locations with dense population concentrations in ways that yield high benefits and low costs.

The principal *benefit* of re-routing tank cars containing hazardous materials is a reduction in the number of people who could be exposed to the deadly impact of a release due to a train accident or a deliberate attack. The principal *cost* of re-routing tank cars is the additional operating expense associated with an increase in the length of haul for all the affected freight cars. Conceivably, some re-routing decisions could also require

changes in train schedules, shifts in revenues from one carrier to another, and increases in shipping costs, but the magnitude of such impacts will vary from one situation to another.

I have with me today examples of alternative routes around six of the nation's highest-threat cities generated using PC*HazRoute.[1] In each case the existing route from the selected origin to the selected destination goes through the city of concern. The results are presented in the summary table below, which shows that the greatest reduction in population exposure is 27% for Los Angeles and the greatest increase in route length is 19% for Chicago.[2] Note that in some cases—including Washington, DC—the new route actually turned out to be slightly shorter than the original routes.

	Washington DC	New York	Chicago	Houston	Los Angeles	Seattle
Origin	New Orleans LA	Mobile AL	Baltimore MD	New Orleans LA	Oxnard CA	Portland OR
Destination	New York NY	Boston MA	Cedar Rapids IA	El Paso TX	Phoenix AZ	Bellingham WA
Reroute Via	Hagerstown MD	Buffalo NY	Streator IL	Navasota TX	Palmdale CA	Kirkland WA
Δ Route Length in miles	-17 (-1%)	-18 (-1%)	+191 (+19%)	+174 (+15%)	+65 (+13%)	+2 (-1%)
Δ Pop Exposed in thousands	-383K (-10%)	-253K (-8%)	-299K (-15%)	-228K (-2%)	-346K (-27%)	-43K (-8%)

Collectively, the nation's railroads have achieved an admirable safety record in transporting tank cars carrying hazardous materials. For example, according to the AAR there was only one accidental release for every 48,000 tank cars shipped in the year 2000. Yet this record does not contradict the fact that moving tank cars carrying extremely hazardous materials through highly populated areas is an unnecessary gamble. A major release accident or a terrorist attack occurring in the midst of a densely populated area will have much graver consequences than if the same attack were to occur in a less populated area. In fact, it can be argued that re-routing tank cars to avoid a high-visibility location like Washington, D.C. would eliminate one of the major incentives for a terrorist attack.

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[1] San Francisco, which is the seventh highest threat city identified by the Department of Homeland Security, was not included in this analysis because it is not situated on any route between other major cities.

[2] Population exposure is measured by the total population residing within one-mile on either side of the route. If the objective of re-routing is to reduce the impact of the worst-case scenario then population exposure should also be calculated separately on the most densely populated segment of the route.